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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/670,841

09/25/2003

Maximino Aguilar JR.

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EXAMINER

WAI, ERIC CHARLES

ART UNIT

PAPER NUMBER

2195

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/670,841

Applicant(s)

AGUILAR ET AL.

Examiner

Eric C. Wai

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-11,13-21 and 23-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-11,13-21 and 23-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All, b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :09/25/2003, 11/11/2005, 05/16/2006, 08/15/2006, 09/19/2006, 10/13/2006, 01/04/2007, 03/29/2007.

DETAILED ACTION

1. Claims 1, 3-11, 13-21, and 23-30 are presented for examination. Claims 2, 12, and 22 were cancelled in Preliminary Amendment dated 03/02/2007.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1, 3-11, 13-21, and 23-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The current focus of the Patent Office in regard to statutory inventions under 35 U.S.C. § 101 for method claims and claims that recite a judicial exception (software) is that the claimed invention recite a practical application. Practical application can be provided by a physical transformation or a useful, concrete and tangible result. No physical transformation is recited and additionally, the final result of the claims is a scheduling operation which is not a tangible result because no actual computation is performed. The following link on the World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101.

http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 3-11, 13-21, and 23-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

- a. The following terms are not clearly understood:

- i. Claim 1 recites, "wherein the first scheduler and the second scheduler are located on the first type of processor". It is unclear how the first type and second type of processors are arranged (i.e. one-to-one correspondence of first and second type of processors? Or multiple second type processors for each first type?). Furthermore, it is unclear whether each first type processor contains a scheduler for every second type processor in the system.
- ii. Claim 10 recites, "a synergistic processing unit". It is unclear how a "synergistic processing unit" is differentiated from a processing unit.

Claim Objections

6. Claims 3-5, 7, 13-15, 17-18, 20, 23-25, and 27 objected to because of the following informalities:

Claims 3-5, 7, 13-15, 17, 23-25, and 27 depend from cancelled claims 2, 12, and 22. For purposes of examination, these claims will be interpreted to depend of claims 1, 11, and 21. Appropriate correction is required.

System claims 18, and 20 are recited as depending off claim 10, which claims the method of claim 1. For purposes of examination, these claims will be interpreted to depend of claim 11. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 3-11, 13-21, and 23-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Valencia (US Pat No. 5,185,861) and Hoffman et al. (US Pat No. 4,394,727 hereinafter Hoffman).

9. Regarding claim 1, Valencia teaches a method for multithreading tasks in a computer environment, said method comprising:

scheduling operation of a plurality of first tasks adapted to be executed by a first type of processor (col 1 lines 60-65), the scheduling performed by a scheduler that

maintains a first run queue that includes data corresponding to the first tasks (col 2 lines 4-5 and 43-44); and

scheduling operation of a plurality of second tasks adapted to be executed by a second type of processor (col 1 lines 60-65), the scheduling performed by a scheduler that maintains a second run queue that includes data corresponding to the second tasks (col 2 lines 4-5 and 43-44).

10. Valencia does not teach the tasks are asymmetrically multithreaded or that the computer system consists of dissimilar processors. Furthermore, Valencia does not teach that first and second schedulers are used to schedule items for the first and second processor, wherein the first and second scheduler are located on the first type of processor.

11. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Valencia in order to run on an asymmetrically multithreaded system with dissimilar processors. It is well known in the art that asymmetrical systems consist of processors with difference features as evidenced by Hoffman (col 2 lines 38-40). One would be motivated by the desire to extend the breadth of Valencia's teachings to apply to other types of multithreaded systems.

12. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Valencia to include first and second schedulers to be used to schedule items for the first and second processor. Since an asymmetric multithreaded system utilizes processors with different features and resources, one would be motivated by the desire to utilize separate schedulers to perform efficient scheduling.

13. It also would have been obvious to one of ordinary skill in the art at the time of the invention to include that the first and second scheduler are located on the first type of processor. Typical asymmetric systems would include processors of varying speeds. One would be motivated by the desire to perform the scheduling functions by the processor with the greatest capability.

14. Regarding claim 3, Valencia and Hoffman do not teach that the scheduling operation of the plurality of first tasks is asymmetric to the scheduling operation of the plurality of second tasks.

15. It would have been obvious to one of ordinary skill in art at the time of the invention that the scheduling operation is asymmetric since the processors operate independently of each other.

16. Regarding claim 4, Valencia teaches that a first identifier space corresponds to the first type of processor and wherein a second identifier space corresponds to the second type of processor; and wherein a first task list corresponds to the first type of processor and wherein a second task list corresponds to the second type of processor (col 2 lines 43-55).

17. Regarding claim 5, Valencia teaches that the scheduling operation of the plurality second tasks further comprises:

receiving a new task from the plurality of second tasks;

Art Unit: 2195

identifying new task attributes corresponding to the new task (col 1 lines 60-61);
comparing the new task attributes with one or more scheduled task attributes (col 1 line 68), the
scheduled task attributes corresponding to one or more scheduled tasks that are included in the second run queue (col 1 line 68); and
performing the scheduling of the new task based upon the comparing (col 1 lines 60-61).

18. Regarding claim 6, Valencia teaches that at least one of the new task attributes are selected from the group consisting of a policy and a priority (col 1 line 68, "bases of priority").

19. Regarding claim 7, Valencia teaches informing the second type of processor to load one of the second tasks in response to the scheduling (col 1 line 68, wherein the processes are schedule to run).

20. Regarding claim 8, Valencia and Hoffman do not explicitly teach that the computer environment includes a plurality of second type of processors, and wherein the second scheduler maintains a plurality of second run queues, each of the plurality of second run queues corresponding to each of the plurality of second type of processors.

21. While Valencia teaches the use of a plurality of N engines, each with its own queue (col 2 lines 43-45), Valencia does not explicitly teach that the engines are of

Art Unit: 2195

different types, and that the second type of processors includes a plurality of such processors.

22. It would have been obvious to one of ordinary skill in the art at the time of the invention, that if Valencia were modified to include the use of asymmetric multithreading, a combination of different types of processors would be possible. One would be motivated by the desire to increase the number of processors available to perform a certain type of task.

23. Regarding claim 9, Valencia teaches that the scheduling operation of the plurality of second tasks further comprises:

receiving a new task from the plurality of second tasks analyzing a plurality of workloads that correspond to the plurality of second type of processors (col 1 lines 60-61);

identifying an available second type of processor from the plurality of second type of processors in response to the analyzing (col 1 line 68 to col 2 line 1, wherein scheduling is performed on engine availability); and

including the new task in the second run queue from the plurality of second run queues that corresponds to the available second type of processor (col 2 lines 1-5).

24. Regarding claim 10, Valencia and Hoffman do not teach that the first type of processor is a processing unit and wherein the second type of processor is a synergistic processing unit.

Art Unit: 2195

25. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to include a synergistic processing unit. One would be motivated by the desire to extend the breath of Valencia and Hoffman.

26. Regarding claims 11, and 13-20, they are the system claims of claims 1, and 3-10 above. Therefore, they are rejected for the same reasons as claims 1, and 3-10 above.

27. Regarding claims 21, and 23-30, they are the computer program product claims of claims 1, and 3-10 above. Therefore, they are rejected for the same reasons as claims 1, and 3-10 above.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric C. Wai whose telephone number is 571-270-1012. The examiner can normally be reached on Mon-Thurs, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng - Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2195

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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